Amendments to the Specification:

Please replace the paragraph beginning at page 8, line 17 with the following amended paragraph:

Referring now to Figure 4, this diagrammatically shows a process monitoring system which is capable of being used to monitor a complex process, such as a fluidised catalytic cracking unit (FCCU) and is capable of utilizing the output of 36 SEVA sensors, referenced SEVA 1, SEVA 2 --- SEVA 36, responsive respectively to 36 measured variables of the process being controlled by on-line controller, and position outputs of actuators, ~~not shown~~ represented in Figure 4 as an actuator 20. The principal function of the monitoring unit in terms of the configuring and utilization of a plant model are shown in Figure 5. The plant model in the case of an FCCU is shown in Figure 6 and is described by McFarlane (1993).

Please delete previous abstract at page 19 and add the following new abstract:

Self-validating (SEVA) sensors implemented in a control process provide various metrics regarding sensed variables to a central control unit. Specifically, SEVA sensors provide measurements of the variables and validity information about the measurements, which may include fault information about the sensors themselves. A control unit utilizes the various SEVA metrics even when large numbers of SEVA sensors are used, a situation that is otherwise problematic due to difficulties in assimilating data from multiple SEVA sensors. Accordingly, the control unit distinguishes sensor faults from actual process changes, and responds as needed, even when large numbers of SEVA sensors are implemented together. Specifically, the monitoring and control unit assimilates signals from multiple SEVA sensors using a multi-variate statistical analysis, and compares results of this analysis with a model characterizing behavior of the process (where the model may take into account actuator position information) and/or historical statistical data.